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Numbers Which Make the News: Online Seminar Series Final Report

Abstract

This document describes the online seminar series “Number which make the news”. These seminars were held by the Iran Media Program in October and November of 2011. The language of the seminars was Persian and the attendants were selected from bloggers, activists, and journalists who work on Iran issues.

This document is organized as follows. First, Section 1 describes the purpose of these seminars. Then, in Sections 2 and 3, the audience of the seminars and the presentation format are outlined. The document continues with Section 4 which contains description of the contents of the seminars and Section 5 which covers the feedback received from the audience. Finally, Section 6 provides the concluding remarks and a list of suggestions for future work. At the end of this document there is an appendix. This section contains the outlines of the individual seminars.

Additionally, this section also contains the list of the pieces authored and published by members of the audience of these seminars, as the members were required to participate in the program. The majority of web addresses provided in the footnotes of this document are in Persian. These addresses point to reference material used throughout the presentations or content produced by audience members. In many cases an English excerpt is provided where the reference is made.

Disciplines

Communication | Communication Technology and New Media | International and Area Studies

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Iran Media Program

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Online Seminar Series

Final Report

[NUMBERS WHICH MAKE THE NEWS]

How to understand numbers and statistics in the news

Document Outline

This document describes the online seminar series “Number which make the news”. These seminars were held by the Iran Media Program in October and November of 2011. The language of the seminars was Persian and the attendants were selected from bloggers, activists, and journalists who work on Iran issues.

This document is organized as follows. First, Section 1 describes the purpose of these seminars. Then, in Sections 2 and 3, the audience of the seminars and the presentation format are outlined. The document continues with Section 4 which contains description of the contents of the seminars and Section 5 which covers the feedback received from the audience. Finally, Section 6 provides the concluding remarks and a list of suggestions for future work.

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1. Purpose

Misuse and abuse of numbers and statistical entities is not limited to political systems in which the leaders entitle themselves to greater freedoms. What, however, makes the flow of suspicious figures in less-democratic societies more prevalent, is the lack of an opposing voice. While better democracies allow for the media and the citizens to criticize the official representation of the statistics reported in the media, despotic regimes own the right to interpret numbers. The role of the latter observers, i.e. the citizens, has become more significant in the new age of citizen journalism. This trend is also emerging in societies in which one voice, the official voice, used to be the only one.

Citizen journalism provides an important opportunity for closed societies in order to step towards more acceptable levels of freedom of expression. This important driving force in the social landscape, however, needs to be nurtured through training. Figures of authority from the establishment commonly attempt to interpret statistics in such a way that it would strengthen the official story. Citizen journalists, or bloggers, need to be able to understand the underlying mathematical assumptions made by the story told in the media, to be able to use appropriate theoretical tools to dissect

the official interpretation, and to produce an alternative explanation, if, as it is often the case, the official interpretation is skewed.

The “Numbers which make the News” seminars aim at providing bloggers, activists, and journalists with insight into the multifaceted subject of interpreting statistical entities. The audience of these seminars are presented with examples which show common situations in which vague definition of statistical figures produce erroneous interpretations. The seminars present the significance of looking deeper into the assumptions which lead to a certain explanation of statistical data. Such errors can and do happen as honest mistakes. These seminars, however, focus on causing awareness for dealing with situations in which the wrongful interpretation of statistical figures is intentional. The Persian online landscape shows that this is a common practice, mainly because numbers strengthen arguments, and therefore there are strong temptations for misrepresentation of numbers when arguments are questionable.

2. Audience

The seminars target individuals who need to be able to communicate and comment on references to numbers and statistical entries present in the statements made by people of authority and often carried by the state-run media. Examples of audience members for the seminars are prominent Persian bloggers and journalists with non-governmental organizations which publish content in Persian.

A member of the audience of the seminars is assumed to have finished high school education but there are no requirements for background in statistics or advanced mathematics. The seminars are designed to give their audience the basic tools necessary for assessing the accuracy of the interpretations of numbers and statistical entities.

The audience of the seminars is assumed to be able to read and understand content in news-style English texts. This requirement is necessary for fact-checking practices which discuss accuracy of content translation from English to Persian.

The seminars target two groups of audience members. The first group are individuals who directly attend the online seminars and work on program homeworks. The second, and larger, group are the general public of the Persian-speaking users of the web. The presentation materials and the video recordings of the presentations are shared with the general public in order to allow the larger audience have access to the contents.

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In total, a group of seventeen individuals, five females and twelve males, are selected. Eleven participants are based inside Iran. Six audience members live outside Iran and are involved with organizations which produce news and analysis in Persian.

3. Format

The seminars are given as online presentations. Each presentation is based on a set of slides, in Persian. The participants attend the seminars through the online collaborative environment Watchitoo¹. The audience watches the slides on their screens and listens to the discussions provided by the presenter. Each member of the audience can communicate with the presenter and the rest of the audience through text messages. The sessions are recorded.

After each seminar the video recording is uploaded to YouTube and the link to the video as well as the file of the slides is sent to the audience members. The link to the video and the slides are also posted on the presenter's blog² and the target social networks³.

All communications are in Persian.

4. Contents

The seminars are based on the following two books,

- Michael Blastland, Andrew Dilnot. **The Numbers Game: The Commonsense Guide to Understanding Numbers in the News, in Politics, and in Life**. Gotham (December 26, 2008)
- John Allen Paulos. **A Mathematician Reads the Newspaper**, Anchor; Reprint edition (Sep 26 1997)

References and examples in the text are replaced with relevant ones published by the Iranian state-run media.

The topic and the contents of the four seminars are described below,

¹ <http://watchitoo.com/>

² <http://persian.kamangir.net/>

³ Facebook, Twitter, Google +, and Friend Feed

1. **Introduction** – Sample news items are given, the official interpretation is challenged, and alternative explanations are given. The need for deeper understanding of the numbers and the statistics carried in the news is described. The concept of varying statistical terms is given (based on Section 4 in Blastland and Dilnot).
2. **To be and not to be, both at the same time** – Brief introduction to the probability theory. Description of the theoretical basis of Averages, Risk, and Sampling (based on Sections 5 and 7 in Blastland and Dilnot).
3. **When too good means suspicious** – Introduction to the precision of different measurements. Discussion about suspicious connections between irrelevant numbers and how inaccurate interpretations result in conspiracy theories (based on Section 5 of Paulos and Sections 6 and 8 in Blastland and Dilnot)
4. **Shocks and Correlations** – Introduction to the differences of correlation and causation, accompanied by examples. Introduction to the possibility of occurrence of out-of-ordinary events. Final remarks (based on Sections 10 and 12 in Blastland and Dilnot).

The detailed outlines of the seminars are given in the appendix.

5. Audience Feedback

Three participants were asked at the end of each seminar to find material related to the topics of the seminar in the published items of Persian language news sources on the web. They were asked to provide analysis of the item and describe the deficiencies present in the item in light of the contents of the seminars. The result was to be a short text in the format of a blog post. These items were then published on a blog maintained by the organizer of the seminars⁴.

The list of the items produced by the participants of the seminars is given in the appendix.

It was decided that interested participants should form a group to follow up with the analysis of references to numbers and statistical entities in the Persian web. Early discussions to publish the outputs of the group for use of the general public were carried out with a prominent online Persian news and analysis content publisher.

⁴ <http://iranmediaresearch.org/blog>

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At the end of the fourth seminar, the audience members were asked to comment on their experience and to provide suggestions for future activities. Here are excerpts from three responses received after this call. The items are translated from Persian to English for the purpose of this presentation. Names of the persons are abbreviated.

These seminars were very interesting for me. Especially because many related topics, such as sampling and others, were presented in an organized and yet concise form – F.K.

I had passed news writing courses before, and I do work in the field, but, nevertheless, these seminars gave me a tool to be able to understand and work with the numbers which appear in the news. I do hope this program is going to continue – E.A.

This was one of the most practical programs I have attended – K.T.

The presenter received two requests for reuse of the material of the seminars in other programs. As the content of these seminars have been released for the use of the general public, permission was granted.

6. Conclusions and Suggestions

The program provided a case-study for the use of online meeting tools as means of training and education for citizen journalists. Iranian users, especially the ones located inside Iran, are generally concerned about the confidentiality of their participation in an event which has attendance from outside Iran or has non-domestic funding sources. The utilized framework provided a successful utilization of online meeting for privacy-concerned individuals.

Analysis of numbers and statistical entities was not a foreign topic for Iranian bloggers, journalists, and the audience of the Persian web. In fact, the seminars were recognized as a formal investigation of the methods applicable to fact-checking and interpretation-assessment efforts. Participants frequently stated their satisfaction with the content and the presentation style of the provided materials.

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While content was based on books published in outside Iran, all the examples were replaced with relevant items published by Iranian state-run media. During conversation with participants of the seminar, they mentioned that they were able to relate to the concepts more because the examples were familiar to them.

Participants of the seminars were familiar with content production for the web, as either bloggers or journalists or both. Homeworks of the seminars were designed to assist the participants in utilizing the new skills within the toolset already familiar to the participants. Quality of the contents produced by the participants showed that they were able to upgrade their skills.

Professional and citizen journalists are important players in the social/political developments of the Iranian society. Training is a necessity for enabling this group to improve its performance. Due to practical reasons, the Iranian diaspora has better opportunities in providing this needed training compared to the individuals located in Iran. It is important, however, that such training programs are designed for the Iranian audience and fit closely with the issues currently faced in Iran. Extreme attention to details is advised in order to circumvent the diaspora-domestic antagonism which is diligently strengthened and emphasized by the Iranian political system.

Appendix

This appendix contains the outlines and the related material for the four seminars.

Seminar One, 17 October 2011⁵

Summary

This seminar provides an introduction to the series. It also describes the motivations for analysis of numbers and statistical entities in the news and opens the discussion. The material provided in this seminar focuses on Regression towards the Mean and asks the users to participate in a game which exemplifies this issue. Then, the seminar focuses on what the reference book addresses as “Up and Down: A Man and His Dog”, in which local quasi-random changes in statistical entities are wrongly presented as evidence for the correctness of a certain hypothesis.

Contents

The seminar opens with the statement “Numbers go up and down. This we know. But there is always that person who interprets favorable changes in the numbers as results of her actions and unfavorable ones as those of her opponents.” It is emphasized that “numbers go up and down and this may in fact not have anything to do with the two sides of the argument”. And also that “in the realm of numbers, quite commonly, the first, and the most trivial, interpretation may not be accurate or correct”. As an example, the phenomenon known as the “Sports Illustrated Cover Jinx⁶” is discussed, in which many of the sportsmen and women whom are featured on the cover page of Sports Illustrated find themselves in professional trouble afterwards. “Research has shown that from 2456 people featured on the cover, 913 experienced declines in their work. Is this evidence for there is something supernatural about the magazine’s cover page?”

The “Sports Illustrated Jinx” is used as an example for the phenomenon of Regression toward the Mean⁷, which describes why athletes at the climax of the career are more probable to experience failure than those still developing their skills. “Regression towards the Mean: When a random variable is close to its maximum range, this variable is more probable to fall, than to rise, in later measurements. Similarly, close the minimum, random variables tend to rise, than to fall”, the presentation material asserts.

A recent news item from the Islamic Republic of Iran Broadcasting (IRIB News) is used for better clarification of the issue. The item is titled “23,000 driving offenses are captured on camera every day⁸”. The item focuses on the alleged positive impact of the installation of traffic cameras on the decline of accidents. Tehran’s chief of Police is cited in the item

⁵ Complete video recording of the seminar is available at <http://www.youtube.com/watch?v=WISMHLOJFqQ>

⁶ http://en.wikipedia.org/wiki/Sports_Illustrated_cover_jinx

⁷ http://en.wikipedia.org/wiki/Regression_toward_the_mean

⁸ http://www.iribnews.ir/MainContent.aspx?news_num=308426

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stating “Cameras have had an important role in the decline of the accident rate and better control over speed limits. These cameras are to be installed in four more highways shortly”. The audience is asked if the Chief of Police has provided correct assessment of the issue.

In order to help the audience acquire practical understanding of the concept of Regression towards the Mean, the members are asked to participate in a Game of Highways. In this game, every participant should represent a highway in Tehran. Sadr, Imam Ali, Navab, and a number of other highways are picked by the audience. Then, the audience members are asked to roll two dices (or use an online random generator⁹) and report the sum of the dices as the presumed number of accidents in the past month in their respective highway. Based on the reported numbers, two highways, Navab and Babaei, are selected, because of their high “accident rate”, for installation of traffic cameras. The “owner”s of the highways are asked to roll the dices and report the accident rate “after the installation of the cameras”. In Navab, the accident count goes down from 13 to 6 and Babaei reports a decline from 11 accidents to 9. The audience is asked if this shows “evidence” for the favorable impact of traffic cameras and if this observation, as the Chief of Police has stated, should be interpreted as the necessity for installing more traffic cameras.

Another news item in the semi-state-run Fars News Agency is given. The item is titled “Decline in Divorce Rates in Qom¹⁰”. The audience is aware of the background of Qom, which as one of the most religious and one of the “holiest” cities in Iran, it also tops other cities in terms of sex trade and family issues. In the news item, the Political and Security Deputy of the Governor of Qom is cited as associating the decline with the “successful programs of avoidance of divorce”. The audience is asked what the essential questions are which ought to be asked from the politician. First, another news item which describes the prior situation in Qom is presented. “Divorce Rate in Qom the Second in the Country¹¹”. Then, the audience is asked if it is the “dog” or the “man”, that is presented in regards with the divorce rate in Qom. This notion refers to a description given in the reference book, in which a man and his dog walking on the edge of an upward hill are imagined. It is dark, and the dog is said to have a shiny piece on his collar. “So you watch as it zips up and down, stops, and switches. How do you know for sure if it the man head up, down, or sideways? How do you know how fast?” Going back to the article on the declined rate of divorce, the audience is warned that the item describes the statistics of the past six months. “Is this a trend? Has there been a particular event which may have had short-term impact on the divorce rate? Is this phenomenon going to stay? Does it have anything to have to the glorified programs?” The audience is asked.

⁹ <http://www.random.org/dice/?num=2>

¹⁰ <http://farsnews.com/newstext.php?nn=13900720000414>

¹¹ <http://www.mehrnews.com/fa/newsdetail.aspx?NewsID=1359585>

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The seminar concludes with the following statements. “Statistical variables change, due to many factors, which are not necessarily related to what the politicians do. Men of power, however, tend to associate good outcomes to themselves and their own actions. These interpretations may not be correct. In order to correctly assess a statistical entity, we need to know its past and also the period in which the assessment is taking place”.

The audience members are asked to submit their homework

Seminar Two, 26 October 2011¹²

Summary

The second seminar focuses on the notions and the implications of probability. The seminar is titled “to be and not to be, both at the same time”. It opens with two arguments. One, that averages often lead to misunderstanding, as they resemble “numbers poured into a mixer”, and, two, that inappropriate treatment of figures which describe risk can produce shocking, yet irrelevant, numbers.

Contents

First, a piece written by one of the participants is briefly discussed. In this piece, which is titled “Formulas for a Fraud, Are they honest about the anti-satellite program?”¹³, the author suggests that “we live in a world in which facts are buried under piles of numbers. We ought to be aware and we ought to look at the facts from more perspectives than the one given”¹⁴.

The seminar opens by a few statements which are presumably correct, from an average perspective, but are in fact incorrect. One statement reads “the man drowned himself in the river. He was told that the average depth of the river is half a meter less than his height.” Another one reads “The absolute majority of the human kind has more than the average number of feet”. The audience is asked “what do we really mean when we cite averages?”

The audience is presented the results of a search on “Average”, in Persian, in a Persian news indexing website¹⁵. “We do hear the word average very commonly”, the audience is cautioned. Then a number of news items published recently in the Iranian media sources, mostly state-run, are given. The sample items discuss averages of different phenomena.

One item quotes the Chief of Police of Western Azabaijan Province stating “The most average ages for criminals charged with homicide in the province is between 15 and 25”¹⁶. The expression “the most average ages” is highlighted. The next item is an analysis item published by Mehr News Agency in which it is stated that “Methamphetamine is the deadly

¹² Complete video recording of the seminar is available at <http://www.youtube.com/watch?v=yu0hN2uFQaA>

¹³ <http://iranmediaresearch.org/blog/101/11/10/21/712>

¹⁴ This piece is discussed in the Audience Participation Section at the end of this document.

¹⁵ <http://news.parseek.com/>

¹⁶ <http://www.isna.ir/ISNA/NewsView.aspx?ID=News-1850108&Lang=P>

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harm for 27,000 Iranian Youth; The average age of consumers is 28”¹⁷. In the piece, it is stated that “90% of the consumers are less than 28 years of age”. The audience is cautioned that if 90% of the consumers are 27 years old, then the two statements would result in the other 10% to be 37 years old. The question here is whether or not the piece has confused “average” with “mode”. The next piece claims that “the average time spent by women doing physical activities is zero”¹⁸. The average of zero, for a non-negative variable, would directly translate into all realization being absolutely zero, i.e. no Iranian woman spends any time doing any physical activities. The next piece is titled “Iranian authorities have discovered an average of 600 tons of narcotics in the past five years”¹⁹. The audience is asked whether this number, “average of 600 tons per year”, is accompanied with any background information or trend, i.e. whether or not this is an increasing trend, how it relates to the rate of drug use and trafficking, and other related pieces of information. The last item concerns the statements made by a high-ranking Police Officer in Tehran. Titled “The average time needed for the Police to arrive at the scene is now about 7 minutes”²⁰, the General is quoted stating “Reduction in the response time of the Police has resulted in 11% increase in the discovery of crime-related material and 27% increase in arrests”. The audience is asked if the reader is aware of other related factors and the arguments for the impacts of other factors, besides quicker Police response, in the aforementioned statistics.

The seminar continues with a brief overview of histograms. A bell-shaped histogram is presented to the audience and the participants are asked to consider this shape as describing the waiting time at a hospital. The audience is cautioned that average is only one of the factors which describe one such histogram. Three different distribution patterns with identical average values are presented to the audience and they are asked to examine the differences.

The first and the second histograms exhibit uni-modal distributions with equal averages. The standard deviation of one distribution, however, is 1.5 times that of the other one. It is described to the audience that, if, for example, the average waiting time in both hospitals is 2 hours, this would mean that assuming that in one hospital 90% of the patients have to wait for between 1.5 and 2.5 hours for treatment then 90% of the patients have to wait for 1.25 to 2.75 hours for treatment in the other hospital.

A third histogram is then presented. This histogram describes a bi-modal distribution with the same average value of the bell-shaped uni-modal distribution presented before. The two distributions are identical in the average sense, but the second distribution describes a hospital in which half the patients have to wait for less than an hour, while the rest have to wait for over 3 hours.

¹⁷ <http://www.mehrnews.com/fa/newsdetail.aspx?NewsID=1433385>

¹⁸ <http://www.shafaf.ir/fa/pages/?cid=79223>

¹⁹ <http://www.irna.ir/NewsShow.aspx?NID=30534208>

²⁰ <http://isna.ir/ISNA/NewsView.aspx?ID=News-1859518>

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The seminar then follows with its second focus, i.e. risk figures. First, a number of risk-related statements adopted from media items are presented. “Junk food increases the risk of sterility in men”, “Sleep disturbances increase the risk of a heart attack 27 times” “Stress raises the risk of death in men by 50%”, and “high blood pressure in pregnant women increases the risk of deformities in infants”. The audience is asked whether or not, and to what extent, these items are accurate.

More careful discussion then follows on an item published by Fars News Agency. The piece is titled “Sleep disturbances increase the risk of a heart attack 27 times”²¹. The audience is warned what “a 27 times more imminent risk” implies. “Is this item accurate? What is the source of this item?” The report is traced back to its source, “Insomnia Might Boost Heart Attack Risk”²², which states that “people who didn't feel refreshed after a night's sleep had a 27 percent increased risk of a heart attack, compared with those who did, the researchers added.” The audience is cautioned about the “Might Boost” in the title of the source. It is emphasized that in addition to other instances of careless translation, a “27% increase in risk” is conveyed as “a 27 times more imminent risk”.

The next two slides provide comparative discussions on two more examples for risk figures. Inaccurate information and arithmetic operations on small numbers are shown to be among the sources of shocking risk figures often reported in the media.

The seminar concludes with the final remarks. “When we hear that a phenomenon is described using its average value, we must ask ourselves what this figure shows. It is vital to know how the statistical entity is shaped around this average. Information about the range occupied by the entity and knowledge of the worst and the best cases are also essential in understanding the phenomenon.” The audience is warned that “the rainbow is in average white”. Regarding risk figures, it is concluded that “when we read that a certain activity or behaviour increases the risk of a certain illness, it is important to know what the probability of occurrence of the illness among a control group is. Arithmetic operations on small numbers can result in large shock figures, which are horrifying and yet non-meaningful”. The audience is asked to consider the differences between journalism and activism.

The audience members are asked to submit their homework

²¹ <http://www.farsnews.com/newstext.php?nn=13900803001391>

²² <http://health.usnews.com/health-news/family-health/heart/articles/2011/10/24/insomnia-might-boost-heart-attack-risk>

Seminar Three, 8 November 2011²³

Summary

The third seminar is titled “Drinking the Ocean” and focuses on sampling. The seminar discusses issues of interest when considering items describing statistical entities inferred based on sampling. Points to consider when performing analysis or comparison based on sampled data are discussed in this seminar as well.

Contents

The seminar begins with brief presentation of two pieces contributed by members of the audience. In the first piece, titled “Examples for Valid Numbers in Persian Media” the author provides a comparison between what he describes as “valid” vs. “invalid” use of numbers. In the second piece, the author discusses Persian BBC’s vague quotation from the former Chief of Traffic Police for Tehran where he compares traffic accident-inflicted leg amputations in Tehran with mine casualties in Afghanistan. The piece is titled “Incautious use of Statistics in Professional Media”²⁴.

The next slide asks the canonical question of this seminar; “Do we know the group we are studying?” “When we read about a decline or a rise, in a certain statistical entity, it is often the current situation which is being compared with another situation. It is vital that comparison should be essentially meaningful between the two situations.” Then an example is given in which hospitals in the UK were required to reduce the fatality in the operation rooms. Assessment showed that the hospitals seemed to have been able to reach the milestone. Further study, however, indicated that the hospitals had become more reluctant to operate on sick patients, for whom fatality was a more probable outcome. Thus, the actual event which had happened was a modification of the problem statement, rather than an accomplishment in the original settings.

An example from the official website of the government of Iran is then given. This item is titled “86% decline in filed complaints in Gonabad”²⁵. The item suggests that the establishment of a pre-trial consolidation committee has had a significant impact in reducing the number of complaints which are referred to a court in the city of Gonabad.

²³ Complete video recording of the seminar is available at <http://www.youtube.com/watch?v=QgQLzaOT9hQ>

²⁴ Both pieces are discussed in the Audience Participation Section at the end of this document.

²⁵ <http://www.dolat.ir/NSite/FullStory/?id=208125>

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The audience is given “what is known” and “what is claimed”. It is known that the number of cases referred to a court has declined by 86%. It is claimed that this favorable decline is the outcome of establishing the consolidation committees. The audience is then warned that other factors may be in play. For example, it is possible that the court system is slow and time-consuming. Therefore, the two sides of the conflict have the faster option of the consolidation committee or the slow process of going through the court system. If these assumptions are correct, then the audience is warned that the decline could in fact represent an indicator of the inefficiency of the court system, rather than evidence for the efficiency of the newly adopted measures.

It is also important to consider that many of the cases examined by either the courts or the committees relate to labour issues. Therefore, it is essential that implications of referral of a conflict to the court by an employee are considered as well. Employment rates and conditions in the reported interval must be considered as well, the audience is cautioned.

Another example, from Fars News Agency, is discussed next. The piece is titled “Cases of fatality in road accidents in the Province of Tehran down by 25%”²⁶. Quoting the head of the safety of Tehran’s Transportation Department, the item suggests that in the past months 58 accident-related fatalities have been reported, compared to the 113 reported in the same interval in the previous year. Also, number of fatalities in the main roads, suburban roads, and the rural roads in the Province of Tehran has gone down from 475 to 357, both measured in six-month periods. Finally, the same official is quoted stating a decline in the number of fatalities in rural roads from 42 to 16.

The audience is asked to consider what the commonalities between main roads, suburban roads, and rural roads are, and what the implications and the necessities for a simultaneous favorable statistical incident in these different types of roads are. “What should have the Police done to cause a positive impact on three different sets of roads, each one of which has its own characteristics and specifications?” The audience is warned that the item describes the work done as “positive interaction of the Police and the drivers and new safety measures”. “Are these descriptions clear enough compared to the size of the alleged achievement?” the audience is asked and cautioned to be critical when “the news is too good”.

The next item is an interview with the Head of the Narcotics Police in the Province of Western Azarbaijan published in ISNA²⁷. The audience is asked to consider the following claims made in the interview; “Drugs discovery is up by 94% this year compared to last year.” “A gang of Heroin smugglers is arrested. The members of this group had positioned

²⁶ <http://www.farsnews.com/newstext.php?nn=13900811001192>

²⁷ <http://isna.ir/ISNA/NewsView.aspx?ID=News-1814419>

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condensed Heroin inside expensive cars in a very professional manner.” “The number of arrests made in the past four months shows an increase of 22% compared to the same period last year.”

The audience is asked to consider the two numbers given in this item, i.e. “94% increase in drug discovery” and “22% increase in arrests”. “What is the golden number in this item?” the audience is asked. The description given in the item appears to indicate that drugs are measured in weight. Therefore, it may be possible that the smugglers have shifted towards heavier materials. If this hypothesis is correct, then the claimed increase in drug discovery is also influenced by this trend, and is not completely a result of better law enforcement by the Police. If drugs are measured in what they are worth, the increase may be affected by a possible trend towards more expensive items. In which case, again, the actions of the Police are not the only decisive factors in the reported favorable statistics.

More importantly, as it appears, 22% more people have been carrying 94% more drugs. This may indicate that a drug trafficker is now in average carrying 60% more drugs. In which case, the 94% increase in discovery is not an achievement for the Police, but merely a result of changing trends in drug trafficking. The audience is asked to consider other cause-and-effect chains.

The next item is a piece titled “Harassment of Women, the Highest in the US”²⁸. The piece is a translation of a report published by the Chinese Governmental Information Desk regarding alleged mistreatment of human rights in the US. The item highlights the following; “51% of Americans are women, but women only occupy 17% of the seats in the Congress and the Senate”, “Women make an average of \$35,475. This number is equal to 77% of what an average man makes”, “Women are the major victims of sexual crimes. The US has the highest statistics of such incidents, at about 13 times that of the UK and 20 times that of Japan.”

The audience is asked to consider if “Sexual Harassment” is defined similarly in different countries. It is also brought to the attention of the audience that the report does not cite the numbers for Iran. The audience is asked how the statistics for Iran would hold up, if they were to be compared in the same framework. The audience is asked to consider the implication of reporting a case of Sexual Harassment in the US, Japan, and possibly Iran.

A few more examples are given and the audience is asked to participate in the discussion. A hypothetical scenario is given, in which a group of 12 hospitals are asked to reduce the wait time in the emergency room by 20%. The end of year assessment shows that 11 out of 12 hospitals have been able to reduce the wait time by 22%. The audience is asked to produce questions which would help to understand if the expected goal has been achieved or not.

²⁸ <http://www.farsnews.com/newstext.php?nn=8903040776>

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The concluding remarks are then given. “When an entity is to be assessed based on a number of statistical measures, and when the entity is aware of the measures, then it is vital that the potential adjustments of the target set are considered thoroughly. When an entity is to measure its own performance, then such attention is more vital.” The audience is asked to consider, before any comparison, if an apple and an orange are not being compared. The audience is told “it is not our job to stop governments and other agencies from altering statistical entities. It is in our interest, however, to discover these incidents.”

The audience members are asked to submit their homework

Seminar Four, 17 November 2011²⁹

Summary

The fourth seminar briefly reviews shock figures and correlation and then focuses on providing a summary of the last three seminars. This seminar gives a list of the “Seven Golden Questions” which are to be used when “interrogating numbers”.

Contents

First, a piece written by one of the audience members is briefly discussed. Under the title “They drink the Internet”, the author provides a critical assessment of the Persian translation of a Cisco poll on Internet usage³⁰.

The first example given in the seminar is a piece published by Fars News Agency titled “Absolute Treatment for Cancer and Arthritis Developed in Iran”³¹. In the piece, the author suggests that a scientist from Qazvin Azad University has been able to receive help from a large team of experts in order to produce “absolute” treatment for different types of cancer, viral infections, and arthritis. The development of the medicine is suggested to have been based on “a new formulation” which is “unprecedented” and which “has no negative impact on healthy cells”.

The audience is warned that “When a claim or a number is significantly better than what is observed commonly, then one of the three options has happened. 1- That this is a special event, of the kind which happens very rarely. 2- That there is a mistake in the report. 3- That there is a mistake in the interpretation of the number.” As an indicator for mistakes in the reporting or interpretation of the item, the audience is cautioned against news items which suggest confidence levels beyond what is achievable in scientific work. “Too much confidence may be a sign that the reader must be suspicious” the audience is warned.

The next item concerns a claim made by a Chief Commander in the paramilitary force Basij. The official states that “10 million Basij members must have 10 million blogs”³². The audience is asked to consider the implications of 10 million

²⁹ Complete video recording of the seminar is available at http://www.youtube.com/watch?v=QbZo0_6imyM

³⁰ This piece is discussed in the Audience Participation Section at the end of this document.

³¹ <http://www.farsnews.com/newstext.php?nn=9001220356>

³² <http://www.farsnews.com/newstext.php?nn=13900624000195>

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active blogs maintained by the members of a paramilitary group in a seventy million people country. A member of the audience follows this lead and publishes an article titled “Gigantic Numbers for Celebrating Basij”³³.

The last item discussed in this seminar is a piece published by Mehr News Agency titled “We will not let even one satellite dish to be seen in Qom”³⁴. In the piece, a top-ranking Chief of Police in the Province of Qom correlates the presence of satellite dishes with what he calls “increased cases of behaviour against the norms of the society”. The audience is asked to consider if an increase in the number of satellite dishes is a cause of change of the norms in a society or that, alternatively, there may be a correlation between the two phenomena, and not a causal relationship.

The seminar then follows with the seven golden questions which the audience is invited to ask when assessing the authenticity and validity of numbers and statistical entities reported in the news. Here, these questions are translated to English.

1- Has a number gone up or down as we would like it to do? What has the value of this entity been before? Are the recent changes signs of long-term trends or essentially local variations taken out of context?

2- Is there any reference to averages? Are average values used properly? Do we know what the range that the variable occupies is? Is this the average of a homogenous set? Do we know for which set this average has been calculated?

3- Is this a reference to a risk? Are the numbers defined properly? Are the circumstances in which the risk is valid defined clearly? Is there proper mention of the risk of the same event in the absence of the certain behaviour or action mentioned in the item?

4- Is there a reference to variations in the value accepted by a statistical entity? Is the subject of assessment aware of the method utilized for measurement? Has the subject carried out measurement as well? What are the possibilities for the first, or the second, measurement to be inaccurate? Have the defining conditions changed within the period? Has the target set remained reasonably unchanged?

5- Are the claims favorable for the reporting body? Is there a report of progress in a number of directions which are not necessarily correlated?

³³ <http://www.mardomak.org/story/67167>

³⁴ <http://www.mehrnews.com/fa/newsdetail.aspx?NewsID=1372440>

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6- Is there any suggestion regarding causal relationship between different entities? Is a causal relationship, in the suggested direction, reasonable? Are there other significant factors which are not reported?

7- Do the numbers comply with common sense? If this a number in units of years, does dividing it into days produce an imaginable number? What are the values accepted by this number in other statistical groups?

The questions are then summarized into a shorter checklist, an English translation of which follows,

The Seven Golden Concerns when Assessing the Numbers in the News

1- Short-term variations vs. long-term trends.

2- Averages which are not useful descriptors

3- The risk of dividing small numbers

4- Perils of self-measurement

5- Numbers which are too good

6- Mistakes in inferring causal relationships

7- Warnings of the common sense

The audience members are asked to submit their homework

Audience Participation

This section contains references to and brief presentation of the materials produced by audience members. The members were required to work on pieces published in Persian media sources and to perform analysis similar to what was given in the presentations. The audience members were asked to publish their content, after it was reviewed by the seminar coordinator, in their personal blogs or in the Iran Media Program Blog³⁵.

A list of some of the materials produced by the participants of the seminars is given below.

“Where have the Villagers Gone?”³⁶

In this blog post, the author discusses an item published in Parsine³⁷ titled “The decline in the rural population five times faster in three year”. The author shows that the legislature has reduced the minimum population required for a village to be considered a town from 5000 to 3500. He argues that the target set has changed, as some areas previously known as villages are not considered towns, and therefore the reported statistics may not directly reflect an outflow of the rural population, as the piece suggests.

“Formulas for a Fraud, Are they honest about the Anti-Satellite Program?”³⁸

The Commander of the Police Force has stated that the program for banning satellite dishes has been “successful”, because “there is a 16% decline in the usage of satellite dishes”. This number has been adopted by a well-known opposition figure outside Iran as indicating that “only 16% of people do not watch satellite programs and the other 84% do”. The authors suggests that the statistics is unclear and both sides are interpreting it towards their own agenda.

“What is happening in the Roads?”³⁹

The Police, the hospital sources, and the speaker of the Surgeons’ Society, each provide different statistics for road fatalities. The author asks what the correct number is for this important phenomenon.

³⁵ ³⁵ <http://iranmediaresearch.org/blog>

³⁶ <http://gerash.wordpress.com/2011/10/17/webinar/>

³⁷ <http://parsine.com/fa/pages/?cid=50137>

³⁸ <http://iranmediaresearch.org/blog/101/11/10/21/712>

³⁹ <http://iranmediaresearch.org/blog/165/11/10/26/720>

“They Drink the Internet”⁴⁰

Cisco’s Internet Usage poll is reported inaccurately, according to the author of this piece. The poll has been apparently done on Internet users. Therefore, the author suggests, it should be no surprise that it shows high internet usage. This detail has not been clearly mentioned in the report.

“Examples for Valid Numbers in the Persian Media”⁴¹

In this piece, the author suggests that use of numbers in the Persian media can be categorized into “valid” and “invalid”. He argues that the media often attempts to perform activist work, thus exaggerating and manipulating numbers in order to inflict change in the target society, whereas according to the author, media must perform accurate reporting and let activists carry out evangelical work.

“Incautious use of Statistics in Professional Media”⁴²

In this piece, the author discusses the vague reference made by Persian BBC to a statement allegedly made by the former Chief of Traffic Police for Tehran where he compares traffic accident-inflicted leg amputations in Tehran with mine casualties in Afghanistan. The author highlights the use of “nowadays” in the piece and asks what that expression exactly means in this context. Furthermore, the author stresses that the fact that the piece discusses amputated legs may stop the reader from assessing the validity and the implications of what is reported, while the author also suggests that the piece fails to report an actual fact-supported number.

⁴⁰ <http://iranmediaresearch.org/blog/165/11/11/14/739>

⁴¹ <http://iranmediaresearch.org/general/blog/169/11/10/29/724>

⁴² <http://iranmediaresearch.org/fa/blog/173/11/11/02/731>